

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for automatically controlling the output of a continuous process that requires mixing of a solid or liquid component with a liquid carrier component, the method comprising the steps of:

a.) setting a quantitative target for weight-% of one or more solids and/or concentration of one or more liquids to the liquid carrier component;

b.) continuously mixing said solids and/or liquids with the liquid carrier component;

c.) determining the true density, ρ , by employing equation (14)

$$\rho = \frac{1}{V} \quad (14)$$

wherein the gas-free volume of fluid, V , is calculated from the equation-(12)

$$\cancel{V} = \cancel{V_1} - \cancel{V_2} = \left(\frac{1}{\rho_1} - \frac{nRT}{P_1} \right) \quad (12)$$

~~wherein R is the Ideal Gas Law constant, and~~

$$\cancel{n} = \frac{P_1 P_2}{RT(P_2 - P_1)} \left(\frac{1}{\rho_1} - \frac{1}{\rho_2} \right) \quad (11);$$

$$V = \left(\frac{1}{\rho_1} - \left(\frac{P_2}{P_1 - P_2} \right) - \left(\frac{1}{\rho_1} - \frac{1}{\rho_2} \right) \right)$$

wherein the solid/liquid mixture with the liquid carrier component is subjected to two different pressures P_1 , P_2 and

wherein P_1 , P_2 , the corresponding densities ρ_1 , and ρ_2 , and T are measured values;

d.) calculating the weight-% of solids and/or the liquid concentration in the mixture from the true density ρ so determined;

e.) comparing the calculated weight-% solids or concentration to the target weight-% solids or concentration; and,

f.) if the calculated weight-% solids or concentration is greater or less than the target weight-% solids or concentration, lowering or raising the amount of solids or liquids mixed in step b.).

2. (Original) The method of claim 1 for continuously coating a substrate, which method comprises:

- a.) setting a quantitative target for weight-% of one or more solids to be coated onto a substrate;
- b.) continuously applying the solids to the substrate via a carrier fluid;
- c.) measuring the apparent density of the slurry;
- d.) determining the true density of the slurry;
- e.) calculating the weight-% of solids in the slurry in the manner recited in claim 1;
- f.) comparing the calculated weight-% solids to the target weight-% solids; and,
- g.) if the calculated weight-% is greater or less than the target weight-%, lowering or raising the amount of solids applied in step b.).

3. (Original) The method of claim 2, in which the substrate is a paper web and the solids component comprises kaolin clay, calcium carbonate, titanium dioxide, or alumina trihydrate.

4. – 6. (Canceled)

7. (Original) The method of claim 1 for controlling the output of a continuous process for preparing a syrup, which method comprises:

- a.) setting a quantitative target for a concentration of one or more carbohydrates and/or carbohydrate-containing liquids to be blended into a syrup;
- b.) continuously supplying the carbohydrate and/or carbohydrate-containing liquid and a dilution liquid to a vessel and mixing said liquids to form a slurry;
- c.) measuring the apparent density of the slurry;

- d.) determining the true density of the slurry;
- e.) converting this true density to the calculated carbohydrate concentration;
- f.) comparing the calculated carbohydrate concentration to the target carbohydrate concentration; and,
- g.) if the calculated carbohydrate concentration is greater or less than the target carbohydrate concentration, lowering or raising the amount of carbohydrates and/or volume of carbohydrate-containing liquids supplied in step b.).

8. (Original) The method of claim 7, in which carbohydrates comprising sucrose and carbohydrate-containing liquids comprising corn syrup and high fructose corn syrup are mixed with a dilution liquid comprising water.

9. – 17. (Canceled)